Trend Study 18-19-97

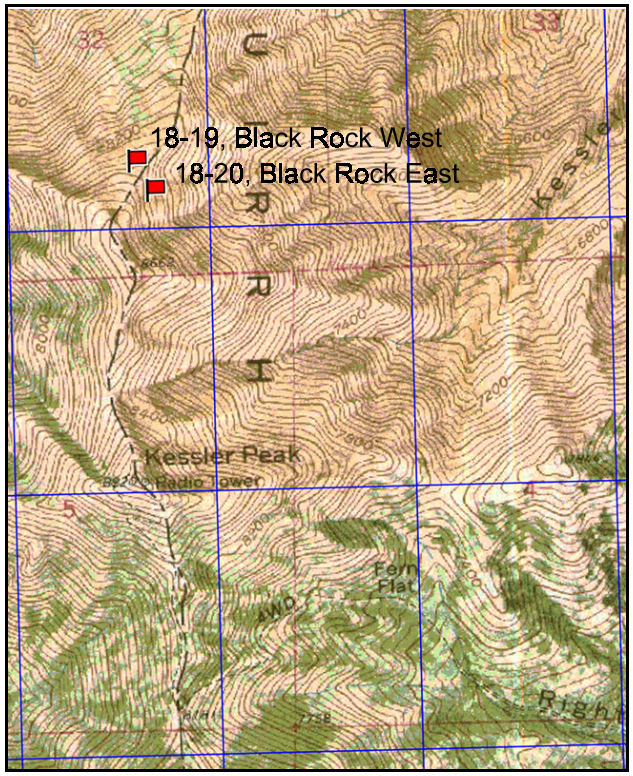
Study site name: Black Rock West . Vegetation type: Perennial Grass .

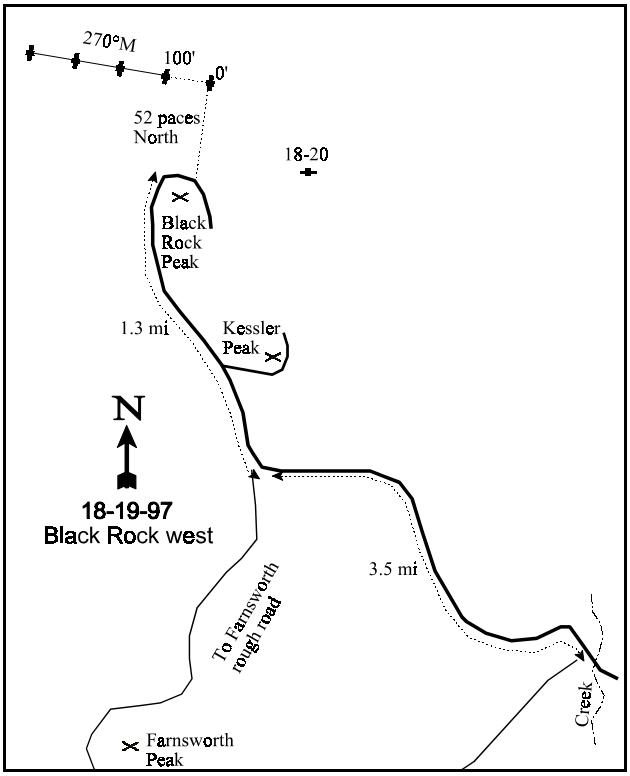
Compass bearing: frequency baseline 270 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (34 , 71ft), line 3 (59ft).

LOCATION DESCRIPTION

Traveling north on Highway #111 turn left (West) (just before the Baccus west gate sign and overpass) on a dirt road which goes up Coon Canyon. Travel west for 0.2 miles to a gate. This gate is controlled by Kennecott and you must get permission to have it opened. From the gate continue up Coon Canyon for 3.9 miles to a fork. Turn right (north) off the main road and travel north west up the right fork of Coon Canyon for 3.5 miles to a saddle and an intersection. Stay right and continue 1.3 miles up a steep road around the west side of Kessler Peak to last switchback west of Black Rock Peak. Park here and walk onto the knoll to the east. From the knoll, walk approximately 52 paces north to the study site. The study stakes are short, green fenceposts.





Map Name: Farnsworth Peak

Diagrammatic Sketch

Township 1S , Range 3W , Section 32

GPS: NAD 27, UTM 12S 4504140 N 398300 E

DISCUSSION

Black Rock West - Trend Study No. 18-19

***SUSPENDED - This site was suspended in 2002. The nearby trend study 18-20, Black Rock East, was retained because it contains more forage and is a better site for monitoring elk use. A pellet group transect was read on this site in 2002. Text and tables from the 1997 report have been retained and are found below.

This trend study samples a high elevation elk range at the top of Black Rock Mountain. It supports a sparse mixed mountain brush community with an abundant grass and forb understory. The site is at a relatively high elevation of about 8,500 feet. It has a moderately steep slope (35%) with a west-north-west aspect. These slopes would be typically blown free of snow in the winter. The effect of the prevailing winds helps maintain a low vegetative growth form for most all species. Use on the site appears to be limited to elk. Pellet group transect data from 1997 indicated 84 elk days use/acre (208 edu/ha). There were few deer pellet-groups found on or around the site. In 1997, grasshoppers were prevalent and appeared to be consuming large amounts of the available herbaceous vegetation. Pellet group transect data from 2002 estimated 40 elk days use/acre (98 edu/ha) and 4 deer days use/acre (10 ddu/ha).

The soil is fairly shallow and rocky, but erosion is limited by the high amounts of protective plant and litter cover. Percent bare soil has decreased significantly since 1990, from 11% to 3%. About 40% of the soil surface is covered with a combination of rock and pavement cover. Soil textural analysis classifies it as a loam with an effective rooting depth of about 10 inches. The pH of the soil is slightly acidic (pH of 6.4) with a soil temperature of 50°F at 10 inches. One thing of note which could be limiting to plant development is that phosphorus is relatively low at 8.1 ppm (10 ppm is considered minimal for normal plant growth and development). Vegetative cover is relatively high, with almost 90% coming from herbaceous species. Soil erosion on the site is minimal.

The site supports small amounts of a variety of useful browse species including serviceberry, mountain big sagebrush, curlleaf mountain mahogany, and chokecherry. The browse species tend to be moderately hedged but they only contribute to about 23% of the vegetative cover. Low rabbitbrush is common and has the potential to increase. Density was estimated at just over 7,000 plants/acre in 1990, increasing to 8,480 by 1997. The rabbitbrush plants are small and some show use.

Although small, the serviceberry sprouts are vigorous. Conversely, the estimate for serviceberry is down significantly from the original density. Some of the change may be due to the much larger sample which gives a much more accurate estimate of its density. Sagebrush grows on similar, but physiologically drier slopes below the study site.

Initially the native grasses had a relatively high frequency. Now in 1997, three species have decreased significantly (bluebunch wheatgrass, muttongrass, and Sandberg bluegrass), while spike fescue has increased slightly. Overall the trend for perennial grasses is down with the sum of nested frequency down noticeably. As before, there is a large diversity of low-growing native forb species. Nineteen perennial species were identified in 1990. Tall forbs such as Indian paintbrush and hawksbeard, and the shorter mountain dandelion are often grazed by elk and deer. In mid-July and August. There is little evidence of utilization of the grasses on this exposure other than the use by grass hoppers in 1997.

1990 APPARENT TREND ASSESSMENT

The trend for soil appears stable with good protective cover from herbaceous species and litter. Trends appear stable for the limited browse on the site, but would not be considered critical for the site is too high to be considered a winter range for deer. The herbaceous understory is abundant and diverse.

1997 TREND ASSESSMENT

The trend for soil is slightly improved with percent bare soil decreasing to about 3%. Herbaceous cover continues to be high. With the much larger sample size, some of the shrubs have shown changes in density. This has been more reflective of the larger sample rather than any real changes in their respective densities. Browse trend is assessed as being stable. The herbaceous understory (perennial species) is slightly down for both the grasses and forbs. Bluebunch wheatgrass, muttongrass, and Sandberg bluegrass have all significantly decreased in nested frequency since 1990. The only grass that has increased is spike fescue which is more adapted to the higher elevation. However, it has not compensated for the losses to the other three species.

TREND ASSESSMENT
soil - up slightly (4)
browse - stable, but a minor component of the community (3)
herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 19

Type	Species	Nested Frequency '90	Nested Frequency '97	Quadrat Frequency '90	Quadrat Frequency '97	Average Cover % '97
G	Agropyron spicatum	$_{b}$185	$_{a}$153	72	63	3.24
G	Bromus carinatus	3	-	1	-	-
G	Leucopoa kingii	159	175	62	69	4.38
G	Poa fendleriana	$_{b}$170	$_{a}$88	65	35	2.47
G	Poa secunda	$_{b}$246	$_{a}$190	84	74	3.14
Total for Annual Grasses		0	0	0	0	0
Total for Perennial Grasses		763	606	284	241	13.25
Total for Grasses		763	606	284	241	13.25
F	Achillea millefolium	83	55	32	27	1.47
F	Agoseris glauca	$_{a}$1	$_{b}$11	1	6	.13
F	Antennaria rosea	$_{b}$273	$_{a}$195	93	71	9.00
F	Arabis spp.	11	15	4	8	.04
F	Arenaria fendleri	284	265	92	91	8.05
F	Astragalus convallarius	-	2	-	1	.03
F	Aster spp.	9	16	4	7	.06
F	Castilleja linariaefolia	28	14	14	7	.11
F	Calochortus nuttallii	$_{a}$22	$_{b}$99	10	51	.28
F	Chaenactis douglasii	30	49	16	23	.33
F	Cirsium spp.	-	15	-	7	.20
F	Comandra pallida	19	22	9	11	.25
F	Collinsia parviflora (a)	-	46	-	17	.11
F	Crepis acuminata	$_{b}$141	$_{a}$34	61	18	.09
F	Draba spp. (a)	2	-	1	-	-
F	Eriogonum umbellatum	10	11	5	6	.22
F	Geum spp.	7	-	4	-	-

Type	Species	Nested Frequency '90	Nested Frequency '97	Quadrat Frequency '90	Quadrat Frequency '97	Average Cover % '97
F	Lathyrus brachycalyx	$_{b}$35	$_{a}$19	12	7	1.26
F	Lactuca serriola	-	3	-	1	.00
F	Lupinus argenteus	17	25	7	14	1.12
F	Polygonum douglasii (a)	-	16	-	7	.08
F	Potentilla spp.	8	10	3	5	.12
F	Senecio multilobatus	1	8	1	5	.05
F	Unknown forb-perennial	1	-	1	-	-
Total for Annual Forbs		2	62	1	24	0.19
Total for Perennial Forbs		980	868	369	366	22.86
Total for Forbs		982	930	370	390	23.06

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 19

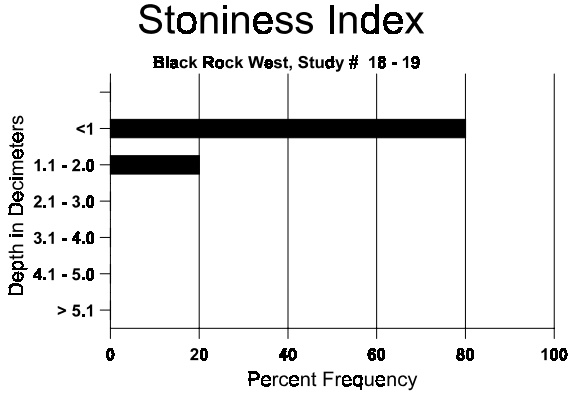
Type	Species	Strip Frequency '97	Average Cover % '97
B	Amelanchier alnifolia	39	1.19
B	Artemisia tridentata vaseyana	3	.00
B	Cercocarpus ledifolius	0	.78
B	Chrysothamnus viscidiflorus viscidiflorus	96	8.87
B	Prunus virginiana	2	.15
B	Quercus gambelii	1	-
B	Symphoricarpos oreophilus	1	-
Total for Browse		142	11.00

BASIC COVER --
Herd unit 18 , Study no: 19

Cover Type	Nested Frequency '97	Average Cover % '90	Average Cover % '97
Vegetation	354	27.75	48.52
Rock	286	22.75	14.85
Pavement	335	17.50	27.34
Litter	386	19.75	17.86
Cryptogams	29	1.25	.16
Bare Ground	159	11.00	2.83

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 19, Black Rock West

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.1	50.0 (9.5)	6.4	36.0	41.1	22.9	6.1	8.1	316.8	.8



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 19

Type	Quadrat Frequency '97	Pellet Transect	
		Pellet Groups per Acre '97	Days Use per Acre (ha) '97
Rabbit	1	-	-
Elk	60	1096	84 (208)
Deer	4	-	-

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 19

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
S	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	90	44	35	8	-	-	-	-	-	-	86	1	-	-	2900			87
	97	6	6	-	-	-	-	-	-	-	12	-	-	-	240			12
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	46	17	2	1	-	-	-	-	66	-	1	-	1340	6	8	67
D	90	3	33	10	4	-	-	-	-	-	47	2	-	1	1666			50
	97	9	4	2	-	-	2	-	-	-	1	1	-	15	340			17
X	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	50%	13%	.72%	-58%
'97	59%	22%	17%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'90	4566		36%
	'97	1920		18%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	2	1	-	-	-	-	-	-	-	3	-	-	-	60	8	9	3
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'90		00%		00%		00%											
	'97		33%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'90		0	Dec:		-
													'97		60			-
Cercocarpus ledifolius																		
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	28	101	0
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'90		00%		00%		00%											
	'97		00%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'90		0	Dec:		-
													'97		0			-
Chrysothamnus viscidiflorus viscidiflorus																		
S	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	90	50	5	-	1	-	-	-	-	-	56	-	-	-	1866			56
	97	43	-	-	-	-	-	-	-	-	43	-	-	-	860			43
M	90	119	18	-	2	-	-	-	-	-	139	-	-	-	4633	7	10	139
	97	370	2	-	-	-	-	-	-	-	372	-	-	-	7440	7	12	372
D	90	6	10	1	-	-	-	-	-	-	16	-	-	1	566			17
	97	9	-	-	-	-	-	-	-	-	7	-	-	2	180			9
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'90		16%		.47%		.47%								+17%			
	'97		.47%		00%		.47%											
Total Plants/Acre (excluding Dead & Seedlings)													'90		7065	Dec:		8%
													'97		8480			2%
Prunus virginiana																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	2	-	-	-	-	-	-	-	2	-	-	-	40			2
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	9	-	-	-	-	-	-	-	9	-	-	-	180	24	14	9
X	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing			Moderate Use		Heavy Use		Poor Vigor								%Change			
	'90		00%		00%		00%											
	'97		100%		00%		00%											
Total Plants/Acre (excluding Dead & Seedlings)													'90		0	Dec:		-
													'97		220			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	5	-	-	-	-	-	-	-	-	5	-	-	-	100	13	15	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	00%	00%	00%	
'97	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'90	0	Dec:		-
'97	100			-

Symphoricarpos oreophilus																		
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	15	49	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'90	00%	00%	00%	
'97	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'90	0	Dec:		-
'97	20			-